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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,847	01/08/2002	Priyank Ramesh Warkhede	28845	4491

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THE LAW OFFICE OF KIRK D. WILLIAMS
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EXAMINER	
BATAILLE, PIERRE MICHE	
ART UNIT	**PAPER NUMBER**
2186	

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/042,847	WARKHEDE ET AL.	
	Examiner	Art Unit	
	Pierre-Michel Bataille	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *18-25,40 and 41* is/are allowed.

6)☒ Claim(s) *9,10 and 28* is/are rejected.

7)☐ Claim(s) *1-8,11-17,26,27 and 29-39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/01/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The instant Office Action is taken in conjunction pro prosecution of the present application currently presenting claims 1-44 for examination.

2. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-8, 11-17, 26-27, and 29-39 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,920,886 (Feldmeier).

With respect to claims 1, 26 and 34, Feldmeier discloses a method and apparatus performing hierarchical address translation using binary and ternary CAM representations comprising: generating a first representation of a hierarchical relationship among a plurality of first prefixes ***(generating a priority field representing a hierarchical level of a ternary/binary hierarchical level addresses)***; determining an optimized representation of the hierarchical relationship among the plurality of first prefixes ***(searching the CAM for an address to b translated matching th***

addresses in CAM to determine which matching ntries have the highest hierarchical level); generating a mapping of the plurality of first prefixes into a plurality of second prefixes based on the optimized representation ***(performing the hierarchical ternary/binary address translation) [Abstract; Col. 5, Lines 46 to Col. 6, Line 20]***.

With respect to claims 4, 5, 14, 27, 31, 33, 37, Fledmeier discloses the system comprising causing an associative memory ***(CAM)*** to be programmed with the plurality of second prefixes ***[Col. 6, Lines 9-19]***, the associative memory includes a binary or ternary content-addressable memory ***[Abstract; Col. 5, Line 36 to Col. 6, Line 19]***.

With respect to claim 6, Fledmeier discloses storing the plurality of second prefixes in a data structure ***[Col. 5, Lines 47-49]***.

With respect to claim 7, Fledmeier discloses maintaining a data structure indicating the mapping ***[Col. 6, Lines 9-19]***.

With respect to claims 8 and 29, Fledmeier discloses the plurality of first prefixes include a network address ***[Col. 6, Lines 20-26]***.

With respect to claim 11, Fledmeier discloses the plurality of second prefixes includes a match all prefix ***[Col. 6, Lines 11-19]***.

With respect to claim 13, Fledmeier discloses determining a set of mapped lookup values based on the optimized representation ***[Col. 5, Line 36 to Col. 6, Line 19]***.

With respect to claims 13, 32, and 38-39, Fledmeier discloses determining a set of mapped lookup values based on the optimized representation and generating a

lookup value from the set of mapped lookup values based on a particular value [***Col. 5, Lines 46 to Col. 6, Line 20***].

With respect to claim 15, Fledmeier discloses receiving a set of information including a first value; generating a lookup value from the set of mapped lookup values based on first value; and generating a lookup word based the lookup value [***Col. 5, Lines 46 to Col. 6, Line 20***].

With respect to claim 16, Fledmeier teaches an associative memory (CAM) to be programmed with the plurality of second prefixes and initiating a lookup operation on the associative memory using the lookup word ***[Abstract; Col. 5, Line 36 to Col. 6, Line 19]***.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 2-3, 12, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,920,886 (Fledmeier) in view of US 5,528,701 (Aref).

With respect to claims 2-3 and 35-36, Fledmeier teaches the invention as claimed, but fails to specifically teach the first and second or optimized representations including a Trie. However, Aref teaches a system and method for matching input data in a Trie database structure having a plurality of nodes, the nodes being partitioned into a

plurality of levels with respective identified elements [abstract Col. 3, Line 66 to Col. 4, Line 5]. Therefore it would have been obvious to one of ordinary skill in the art to have a trie representation in the hierarchy because a trie at a hierarchical level is best used to provide an effective and efficient way of accessing certain types of data and other data associated with the accessed type of data in an associative manner; and the Trie would have, therefore, provided a way of determining if one single matching input is proper at multiple levels as the input is applied at each level and search for the best representation. A Trie proves compact and easily searchable implementations of an IP routing table structure which can store both unicast and multicast addresses with the same average search times.

With respect to claim 12, Fledmeier teaches the invention as claimed but fails to teach the plurality of second prefixes includes a node for an internal node of the first representation. However, Aref teaches a system and method for matching input data in a trie database structure, the nodes being partitioned into a plurality of levels with respective identified elements and applied to a multimode structure [abstract; Col. 9, Lines 45-53; Col. 3, Line 66 to Col. 4, Line 5]. Therefore it would have been obvious to one of ordinary skill in the art to have a trie representation in the hierarchy because a trie at a hierarchical level is best used to provide an effective and efficient way of accessing certain types of data and other data associated with the type of data in an associative manner. Therefore, it would have provided a way of determining if one single matching input is proper at multiple levels as the input is applied at each level and search for the best representation. A Trie proves compact and easily searchable

implementations of an IP routing table structure which can store both unicast and multicast addresses with the same average search times.

Allowable Subject Matter

7. Claims 18-25 and 40-41 are allowed.

8. Claims 9-10 and 28 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 20030174717 (Zabarski et al) teaches the technique, referred as the Optimized Multi-bit Trie (OMT) approach, mapping a routing table having prefix entries and next hop identification (NHID) values into a compact and readily searchable data structure.

US 6,717,946 (Park et al) teaches an associative memory storing mapped subtrie ranges with a mapping engine receiving a particular value and generates a lookup word including a mapped representation of the particular value.

"IP-Address Lookup Using LC-Tries," Stefan Nilsson and Gunnar Karlsson, IEEE Journal on Selected Areas in Communications, page(s) 1083-1092 Jun. 1999.

Fast IP routing with LC-Tries; achieving gbit/see speed in software, (Internet/Web/Online Service Information); Stefan Nilsson et al.; Dr. Dobb's Journal; July 2, 1998.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre-Michel Bataille whose telephone number is (571) 272-4178. The examiner can normally be reached on Mon-Fri (9:30A to 6:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew M. Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pierre-Michel Bataille
Primary Examiner
Art Unit 2186

January 14, 2005

PIERRE BATAILLE
PRIMARY EXAMINER